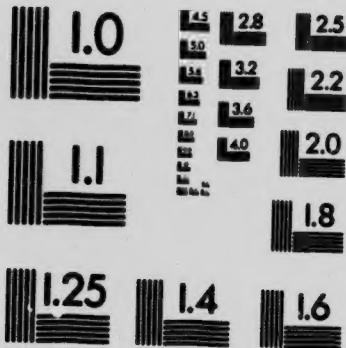


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**Nova Scotia Department
of Agriculture**

N. S. A. C.

BULLETIN NO. 6

**The Manufacture of Dairy Products
on the Farm**

BY

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TRURO, N. S.

630.4

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Nova Scotia Department of Agriculture

N. S. A. C.

PREFACE.

This bulletin has been prepared with a view to stimulating the home manufacture of cheese and other milk products which, both from the standpoint of economy and health, are too much neglected in the rural homes of our country. In writing this bulletin, we have to be as brief and explicit as possible so that those who make use of it will not find themselves involved in long details. We recognize however, that unless one has had some experience in the making of these milk products, such person will have difficulty no matter how much detail we might give. For the benefit of those who find themselves confronted with this difficulty, we would say that in the various courses given in the Dairy Building at the Agricultural College in Truro, and more especially at the Short Course in January, demonstrations in the making of nearly all the milk products referred to in this bulletin will be given and students will have an opportunity of making these products themselves. In other words, this bulletin will practically form the text book for such instruction as is given along these lines in the Short Course at the College.

We can only add that we hope that in some measure this bulletin may serve the purpose of encouraging the further use of milk and its products.

W. A. MACKAY.

Truro, December, 1914.

INTRODUCTION.

Milk and its products are the most wholesome, energy producing and still the most economical of any food products produced on the farm, can be served in so many ways as to always give a good variety and can be made to serve a place among the finest delicacies, desserts and luncheons as well as the heavier portions of a meal.

Milk is available on practically every farm in Nova Scotia, but with few exceptions its use is largely confined to drinking and the making of butter. Of all the many varieties of cheeses and other products that can be made from milk, practically none are to be found on the farm, where it is possible to have all of these in the most economical way and at the first cost. Even the old fashioned home made cheese and curds, that used to be quite common, are

now rarities. Perhaps this is due to the fact that the older people who used to make these things are now passing away and the younger people do not understand the process of manufacture.

This bulletin is published with the hope that it may be of some use in this direction and may result in having a better quality of butter manufactured on the farm, a renewal of the dairy cheese in our diet and an addition made of many of the soft cheeses, ice cream, etc., which could be made to serve a very useful place in our diet.

THE CARE OF MILK.

The first essential in the manufacturing of any dairy product is good *clean* milk. Many a good dish of dairy butter, cheese, or any other milk product has been spoiled by the milk, from which it was made, being tainted or having some foreign substance enter into it, and many persons have turned in disgust from using dairy products owing to the fact that, at some time or another, they have been given some product manufactured out of tainted milk. To get clean, pure milk, there are certain rules that must be followed and it must be borne in mind that there is only one reason for dirty milk and that is carelessness.

First, then we must have clean healthy cows, properly cared for and not fed with feeds that will taint the milk.

Second, Their flanks and udders ought to be clipped in the fall, and kept clean by wiping before milking.

Third, Use sanitary tin milk pails, with all seams, etc., properly soldered. The hooded pail is to be recommended. It will keep out a lot of dust, etc.

Fourth, Milk with dry hands.

Fifth, Remove the milk as soon as possible and strain. Use the funnel shaped strainer with two to four ply cheese cloth fastened on by either cord or a tin band.

Sixth (a) If the milk is to be separated, separate as soon as possible, seeing that all parts of the separator are clean and pure.

(b) If not to be separated, cool as quickly as possible to below 60 degrees, by placing in cold water.

Seventh, Always keep milk or cream where the air is pure and watch the temperature.

Eighth, Stir often using the saucer shaped stirrer, only when the cream is wanted to rise.

Ninth, Keep the separator, milking utensils, dairy and all that the milk or cream comes in contact with scrupulously clean by washing, scalding and airing after each time in use. Use also lots of common sense and the good flavor of whatever dairy dish you wish to make is assured whether it be a drink of milk, a print of butter, a cheese, a or a dish of ice cream, or any of the other delicious dishes.

BUTTER MAKING.

It is not the intention of this bulletin to advocate buttermaking on the farm. We believe for the average condition in Nova Scotia, where butter making is carried on, it can be done more economically through the medium of a well organized and well conducted creamery but there are exceptional cases where it is more profitable to manufacture at home. Moreover, in many districts, there is considerable butter manufactured, but not enough to operate a creamery economically enough to make it profitable. The quality of a whole lot of the dairy butter going on the market has not been good enough to warrant the best prices for it. For conditions such as these, we trust the following may be useful.

Assuming that we have good *clean* milk fresh from the cow ready to start, we would separate by means of the hand separator just as soon as possible and while the milk is at a temperature of over 80 degrees. See that the machine is in proper condition, set level and solid, all bearings properly oiled, the full speed as indicated on the handle attained before separating is commenced and kept uniform throughout the run. Flush clean with either skim milk or warm water; make the cream to test between 25 per cent and 30 per cent fat if a test is available, or rich enough to make three to three and one-half lbs. of butter to the gallon of cream. Cool the cream as soon as possible to below 60 degrees by placing the can in cold water.

THE DEEP SETTING SYSTEM.

If you have not a separator, use the deep setting system. The way of the shallow pan is past, for with this method there is too much danger of taints getting into the cream. Use the ordinary shot gun cans 8 inches in diameter about 22 inches high. As soon as possible the cans of milk should be placed in cold water, and kept at a temperature of 48 degrees or lower for 24 hours. Ice is required unless very cold water is available. If the cans are not provided with taps at the bottom a cone shaped dipper should be used for removing the cream. Loosen the cream from the can with a knife. Dip the skimmer in skim milk or water then lower it, point first into the can and allow the cream to flow evenly into it.

The loss of cream in the skim milk will always be greater than with a good separator and we would always recommend the use of a separator, where over one or two cows are kept.

Ripening the Cream.

The car for holding the cream until churning should be large enough to hold all that is made in one churning, and preferably made of tin with a neat fitting cover. Have the cream cooled to between 55 and 60 degrees, before putting it into the can. Never add new

cream to the old until it is thus cooled. Each time new cream is added, give the whole lot a thorough stirring. Keep the can in a place where the air is pure and everything clean. If ripening naturally, heat the cream to between 60 and 65 degrees and about 24 hours before churning keep at a temperature at which it will thicken 12 hours before being churned, then cool to churning temperature.

Churning.

When the cream is ready to churn it should be quite thick, pouring like thick molasses and having a smooth shiny appearance and a slightly acid taste and smell.

Churn at a temperature that the butter will come in from 20 to 30 minutes. A range of temperature that would cover most farm conditions would be 54 to 58 in summer and 58 to 64 in winter.

Thoroughly scald and cool the churn, strain the cream into the churn through a strainer dipper. If the butter is too light in color, add to the cream what color is required, which will vary from very little up to 4 or 5 drops per estimated pound of butter. Do not have the churn over one-half full.

Using the barrel churn, churn as fast as the cream will fall in the churn and cause a concussion, letting the gas off two or three times in the first five minutes.

When the butter is "broke" and just before it starts to gather add one pint to one quart of water at about the same temperature as cream and churn rapidly until the butter is in granular form. The peep glass will be clear with no tiny specks of butter adhering thereto and tiny bubbles will start to form on the buttermilk around the wall of the churn.

If the butter does not gather easily, run off part of the buttermilk and churn again for a few minutes. The butter ought to gather in from 2 to 5 minutes from time it breaks.

Run off the buttermilk, straining through the strainer dipper. Wash the butter by putting in about as much water as buttermilk at a temperature to be governed by the firmness of the butter, give the churn about half a dozen turns and then draw off the water. If the water comes away fairly clear and the butter is going into quick consumption, one washing will be enough, but if the water is not clear or if it is to be kept for some time, wash a second time, using about the same amount of water as the first time.

When the water is drained off, the salt may be added, preferably in the churn, using a good brand of butter salt and enough to suit the requirements of the market, generally speaking about one ounce to the pound of butter. Sprinkle one-half the salt on the butter; rock the churn back and forth and then add the balance, rocking the churn again, and then let stand for five or ten minutes until the salt dissolves.

If possible use a V shaped lever worker. Prepare it by scalding

thoroughly and then cooling. Work the butter until the free moisture is nearly all gone, and the butter takes on a firm appearance. Generally about eight turns is enough. By a turn we mean pressing the butter with the lever until it is of a uniform depth of one to two inches, then rolling across the worker and turning at right angles to be pressed down again.

Put up the butter with a neat, tidy appearance and in such package as best suits the market. If using one or two pound prints, be careful to see they are the proper weight and wrap in pure vegetable parchment paper, preferably with the name of the dairy printed on the paper. If putting in crocks, tubs or boxes, have the package first lined with parchment paper and fill about one half inch from the top, finishing with a smooth appearance and one layer of parchment paper neatly cut to fit the package.

Keep the butter in as cool a place as possible and where the air is pure and clean.

In washing the churn, worker and prints, use some washing compound, such as Wyandotte, or washing soda and occasionally a handful of salt which will help to keep the butter from sticking to the worker.

A starter may be used for ripening the cream, about 5 per cent buttermilk from the last churning if the flavor is right, will answer the purpose. This may be put in with the first of the cream but preferably when the cream is warmed up for ripening. Great care must be exercised, however, in the use of a starter to get the best results.

Churns.

We recommend the use of the barrel churn and the V shaped lever butter worker, and the foregoing has been in accordance as better results can be obtained than by the use of the dash churn or some of the other varieties on the market. A small combined churn and butter worker is now on the market that is giving very good results. Working butter on the butter bowl with a butter spoon or ladle tends to spoil the grain of the butter and makes it greasy. It is also more difficult to get it evenly worked so that the salt is all evenly distributed and the free moisture escapes.

Dairy Cheese.

The making of butter is a process of ripening the cream and using concussion to gather the fat globules to form a mass. In making cheese, however, we want to use the casein in the milk as well as the fat, and the process is one of first having the milk at a proper degree of acidity, then thickening with rennet, cutting in small pieces and allowing the whey to drain off. Consequently, temperature is one of the main factors in the process of manufacture and

the proper temperature must be maintained to ensure the proper drainage.

The making of Cheddar cheese as it is done in the cheese factories, requires considerable machinery and takes from eight to nine hours, but for farm dairy work a shorter and more simple process is desired. The following method will require four to five hours and, if followed carefully, will give good results.

For every ten pounds of cheese required, take 100 lbs. of milk (10 gallons). The milk should be of good quality, clean and sweet, as it is impossible to make the cheese of any better quality than the milk from which it is made.

Take the morning's milk and mix it with the night's milk in a vat or some vessel suitable for holding milk; a clean wash boiler will answer the purpose. Heat the milk to 86 degrees F. by placing a clean can of hot water in it or by reversing this and placing the vessel in a large vessel of hot water, or by setting the vessel containing the milk on the stove and stirring until the desired temperature is reached.

If colored cheese is wanted, use one teaspoonful of cheese coloring for each 100 lbs. of milk. Add the coloring to a dipperful of milk and mix it thoroughly through the milk by stirring with a dipper for about three minutes.

Cover the vat until coagulation takes place, which will be in about twenty minutes, depending on the ripeness of the milk; the sweeter the milk, the longer the time required.

To ascertain when the curd is sufficiently coagulated for cutting, push the forefinger into the curd at an angle of 45 degrees, until the thumb touches it, make a slight break in the curd with the thumb then gently move the finger forward. If the curd breaks clean across the finger without any flakes remaining on it, it is ready to be cut.

For cutting, regular curd knives are the best. Use the horizontal knife first cutting lengthwise of the vat, then cut both lengthwise and crosswise with the perpendicular knife. This gives small cubes of even size.

When curd knives are not available, a long bladed knife may be used, cutting the curd lengthwise and crosswise in the vat in strips one-third of an inch wide, then cut horizontally. By this method it is difficult to cut the curd evenly.

After the curd has been cut, it should be gently stirred with the hand or with a small wooden rake for ten minutes before applying heat.

Heat the curd to 98 degrees, taking about 30 minutes to do so. Continue stirring until the curd is ready for dipping; this is usually about 2 to 3 hours, from the time the vat was set.

When the curd becomes firm and springy and falls apart when a handful is pressed together, it is ready to have the whey removed.

The whey may be drawn off and the curd piled in one end of the

vat, or the curd may be removed from the whey by means of a strainer dipper, spreading a large cheesecloth over a level butter worker and placing the curd on it to drain.

Stir the curd for ten to fifteen minutes, to allow the surplus whey to escape, before salting.

Sprinkle the salt over the curd, allowing one ounce of salt for every 25 lbs. of milk. Mix it thoroughly, and when the salt is dissolved the curd will be ready to put to press. Between 80 and 84 degrees will be a suitable temperature to have the curd at this stage.

The cheese hoop or hoops, should be made of heavy tin with two handles on the outside. A suitable size for home use would be 7 or 8 inches in diameter and 12 or 14 inches high. It is also necessary to have a wooden follower, which will fit nicely on the inside of the hoop.

Place a piece of cotton at the bottom of the hoop, as a temporary cap; then put the cheese bandage inside the hoop. Carefully pack in the curd; fold over the end of the bandage; place on top a piece of cotton similar to the one at the bottom; then put on the wooden follower and put to press.

If a press is not available use a lever press. Take a piece of scantling 10 or 12 feet long for a lever. Place the cheese hoop on a strong box about three feet from the wall. Nail to the wall a piece of scantling and under it put one end of the lever. Put a block of wood on top of the follower for the lever to rest on. A pail containing stones or iron may be used for the weight. Do not apply full pressure at first.

In three quarters of an hour the cheese may be taken from the press, the bandages wet with hot water, pulled up smoothly and trimmed neatly, allowing one-half inch to lap at the ends. Cover the ends with circles of stiffened cheesecloth; over that place a piece of cotton dipped in hot water. Return the cheese to the press until the following morning, when it should be turned in the hoops and pressure continued for a few hours longer.

After removing the cheese from the press, place it in a cool dry cellar to ripen.

Turn the cheese end for end on the shelf every day for a month and afterwards occasionally. These cheese will be ready for use in about 6 or 8 weeks.

To prevent the cheese moulding and to keep them from drying too much they may be dipped in hot melted paraffine wax. Another method to prevent mould is to put a double cloth on the cheese until ready for use. The mould will be on the outside cloth, leaving the cheese clean when it is removed.

Rennet and color can be obtained at any cheese factory or can be got in 25c. bottles from the Nova Scotia Agricultural College, Truro.

Cottage or Dutch Cheese.

This may be made out of whole or skimmed milk. Let the milk stand in a warm place at a temperature of 100 degrees until the milk sours and the curd separates from the whey. Turn the curd into a coarse cotton bag or towel and hang to drain in a moderately cool place for from 6 to 12 hours or until the curd is free from whey. Add salt to suit the taste from one-quarter to one-half ounce to the pound, and mould into small balls or press into a dish or any desired package.

Thick milk may be set over warm water until the whey separates. The water must not be too hot or the curd will be hard and dry.

Drain and prepare as already described.

Cottage cheese may be eaten as it is, with potatoes, or with cream and sugar, with cream, pepper and salt; or with stewed fruits. A good cottage cheese should have soft, smooth texture, being neither mushy nor dry. The flavor should be that of mildly sour milk with an entire absence of the bitter taste or objectionable flavors.

Buttermilk Cheese.

Heat buttermilk fresh from the churn to a temperature of 80 degrees stirring very carefully and only enough so that it will not burn on the sides of the dish. Let stand at this temperature for one hour then continue heating and stirring as little as possible until a temperature of 130 degrees is reached. Let stand again at this temperature for one hour, then pour carefully into a draining cloth or tank made of tin with bottom of perforated tin and covered with one thickness of cheese cloth. Allow to drain and scrape down and turn out every two to three hours until dry enough to salt, which should be in 8 to 10 hours, if room temperature is about 65 degrees. Salt to suit the taste, about one-quarter to one-half oz. to the pound of curd. Mix in salt well and allow to drain 20 to 30 minutes. Then mould in any desired form and use same as cottage cheese.

Soft Cheese Making.

Soft cheese are practically new in this country and up to the present the market for them is very limited as the taste for them has not yet been acquired.

We only give the process for making three different varieties, one of whole milk, one part cream and part milk, and one pure cream. Almost an endless variety of different cheeses are made but the principles observed in making these is largely the same in many others.

The main object in the making of soft cheese is to retain in the cheese a high percentage of moisture together with the fat which produces the soft texture, hence the name "soft cheese."

As none of these will keep for any great length of time, being usually eaten in the fresh state, one must have a ready market for them.

An occasional lot made on the farm will make a delicious and appetizing dish on the table.

Camembert Cheese.

Apparatus Required:—

Rennet.

Cheese coloring.

1 Minum Glass.

1 Thermometer.

1 Dipper.

Granite pail of convenient size to hold milk.

Straw Mat, size 13 x 8 in.

Boards 14 x 8 in. $\frac{1}{2}$ in. thick.

Molds about 5 in. in diameter and 5 in. high.

Material Required for 10 lbs. Milk.

Color— $1\frac{1}{2}$ minums.

Culture—10 minums.

Rennet—15 minums.

Salt— $\frac{1}{2}$ oz. to the lb. of cheese.

Process of Manufacture:—

This cheese is made of new milk of good flavor. First add a small amount of culture if required. No culture is needed for good clean sweet milk when it can be obtained. The milk is now regulated to a temperature of 86 degrees, color added and rennet diluted in about ten times its own volume of water. Stir the rennet in for five minutes and then stir over the top again in 2 to 5 minutes as this prevents the cream from rising which causes the cheese to break after they are made.

Cover the pail and leave until coagulation has taken place which will be in about one hour. The correct time is when the curd breaks easily over the fingers.

Scald the required number of straw mats, boards, molds, then cool them in water. Place the boards on a drainer with the straw mats and molds on top, next ladle out with a dipper a little curd into each mold and repeat the same every 20 minutes until all the curd is transferred and the molds are full. In ladling the curd, care should be taken not to break it but obtain it in thin slices. When the curd has been filled into the molds, turn the cheese by putting a straw mat and board on top and turning over. Leave the cheese on the drainer till the whey has drained off and the cheese are firm enough to turn by hand. After turning the cheese is left in the mold for six

hours longer when the mold can be removed and in another six hours the cheese is ready to salt.

Salting is done by rubbing about one half ounce of salt on the outside of each large cheese. After salting the cheese are left on the straw mat for twelve hours where further draining takes place. The cheese is now ready for use or to pack and ship. The room in which the cheese are made should have a temperature of between 60 and 70 degrees.

Gervais Cheese.

Apparatus Required:—

One-half pint bottle of Rennet.

One-half pint bottle color.

1 Minum Glass.

1 Dipper.

1 Granite Pail of convenient size to hold milk and cream.

Molds $2\frac{1}{2}$ inches high by 2 1-8 inches diameter in a group of six.

Straw Mat and Board as in Camembert Cheese.

Strips of Blotting Paper $2\frac{1}{2} \times 7\frac{1}{2}$ inches.

Cloths of Huckabuck Towelling about 24 inches square.

Materials Required for 10 lbs.

Color—5 Minums.

Culture—10 Minums.

Rennet—45 Minums.

Salt— $\frac{1}{2}$ oz. per lb.

Preservative 1-8 of 1 per cent.

Sodium Benzoate.

This cheese is made from a mixture of new milk and cream, the mixture being in the proportion of two parts milk to one part of cream testing 22 to 25 per cent. The temperature should be about 65 degrees. Add color diluted in water and rennet diluted in about ten times its own amount of water. Stir thoroughly and cover over to set. When thick it is ladled into the cloths holding four to five pounds each, first dipped in warm water and wrung out. This should be ready to dip in two and a half to three hours. Hang up loose to drain and scrape down every two or three hours until ready to salt, which should be by the end of the second day. The curd is ready to salt when it has expelled all the free moisture and will stand up alone. Put on the salt, work over with knife and knead a little. Tie up again as tight as possible to drain for 10 or 15 minutes, when it is ready to mold. The molds should be lined with thin blotting paper and placed on a straw mat or cloth and the cheese pressed in with a knife or a bone spoon. The cheese may then be shaken out of the mold and are ready for use. If kept they should put in a refrigerator or cold storage until used.

Double Cream Cheese.

Apparatus Required.

One-half pint Rennet.

One-half pint Cheese Color.

Salt.

1 Thermometer.

1 Dipper.

1 Minum Glass.

Molds size 2 inches x 3 1-2 inches, x 1 1-4 inches deep.

Cloths of Medium Weight Duck 27 inches square.

Wax Paper.

Materials Required for 10 lbs. cream.

Color—5 Minums.

Rennet—45 Minums.

Salt—about $\frac{1}{2}$ oz. to the lb.

10 minums of culture may be used if cream is nice and sweet. If bad flavor, use a little more.

Have cream testing about 22 per cent. of butter fat, new, perfectly sweet and of good flavor. Get the temperature to about 65 degrees, add the color diluted in a small amount of water; then dilute the rennet in ten times its volume of cold water, stir it thoroughly into the cream and let stand covered over to set.

When the cream has thickened, which should be in about three hours, ladle into dry cloths and hang up and put in a dry place. It is advisable not to put too much in one cloth as it will be likely to develop too much acid before draining.

A few hours later open the cloth and scrape the sides to facilitate draining; then hang up again. Repeat the scraping at intervals of about three hours until the curd is fairly firm. Salt when curd is firm enough that it stands up well alone and no more free moisture will escape. Salt at the rate of about one ounce to three pounds and mix it well into the curd, tie up the cloths again as tight as possible and hang up to drain for about half an hour when it is ready to mold. Line the tin mold with wax paper and press the cheese in with a knife or bone spoon making the curd quite flat on top. Fold over the ends of the paper and shake the cheese out of the mold; they are then ready to be eaten; if kept, they should be put in a refrigerator or cold storage until used.

General Notes on Soft Cheese Making.

The Double Cream and Gervais Cheese can be put up in any desired package for home use or for market, such as small bowls glass tumblers, or specially prepared parafine lined containers that can be bought of any desired shape and size.

Ten pounds of milk or cream equals one gallon.

One Cubic Centimeter equals 20 drops.

60 minums equal one Dram.

About 1 1-6 drops equals 1 minum.

The use of starter in soft cheese making is only recommended in special cases and where a good general knowledge of the making of a good clean starter has been acquired as it is better to have no starter at all than a poor one.

Preservatives can only be recommended when the cheese is to be kept for some time and then only in very small quantities.

Devonshire Clotted Cream.

This cream is extremely rich and is delicious with apple pie, fruits, etc., and is commonly recommended by physicians as a fatty food. It is prepared as follows:

Strain the new fresh milk into open pans from 6 to 10 in. deep, and allow the pans to remain in a cool place where the air is pure, for from 10 to 24 hours, so that the cream may rise to the surface. The time will vary according to the weather. Then scald the pan of milk with the cream on the surface by gradually bringing to a temperature of 175 degrees, or until a wrinkled appearance develops, and spreads all over the surface. This can be done by placing the pans on the kitchen range and must take at least one-half hour to develop the characteristic burnt flavor. Cool the pans down rapidly by placing in cold running water and when properly cooled, the cream will be found thick and clotted and may then be removed with a perforated skimmer.

Whipped Cream.

The main essentials in order to have the best success in whipping cream is to have good rich cream at least 22 per cent, and at least 24 hours old. Fresh cream from the separator will not whip; it whips best just before beginning to sour.

Set the vessel with the cream in a dish of cold water or ice and water until it is thoroughly cooled between 45 and 50 degrees. If above that, it is liable to churn. Cream should treble its bulk in whipping. Thin cream will, whip best with a whip churn; and rich cream with a Dover egg beater.

Junket.

This is one of the old-fashioned dishes made out of milk and is not as commonly used as formerly. It is very wholesome and makes a pleasing dessert.

To each quart of fresh rich milk, use one-quarter cup of white sugar, a teaspoonful vanilla and 1 junket tablet or 6 to 8 drops of rennet extract.

Crush the junket tablet and dissolve in a teaspoonful of cold water. Mix the sugar with the milk and heat to a temperature of about 100 degrees. Add the flavoring, stir well and pour into the serving dishes. After the milk sets or thickens remove to a cool place about 50 to 60 degrees until serving. Before serving, the top can be sprinkled with powdered sugar and cinnamon mixed, and used with cream, whipped cream, or Devonshire cream.

A pleasing change can be made by flavoring with chocolate, caramel or any other desired flavor.

ICE-CREAM.

Formerly ice-cream was considered only as a luxury and used very little. More recently its food value has been more fully realized and being a very delicious dish, it has become more popular yearly and is now recommended in cases of sickness by many physicians. It is a very popular dish, it is used the year round, but its use has become more popular in the towns and cities than on the farm, where naturally it might be used the most as it can be made at home at first cost. The cost of equipment is very little, only a small ice cream freezer holding from 4 to 8 quarts, and ice is required, and on nearly all up-to-date farms ice is now stored for summer use.

The cream to be used does not require to be very rich, that containing from 20 to 25 per cent fat giving the best results, and should be from 24 to 48 hours old and kept in a cool place, preferably under 50 degrees.

The ice to be used can be crushed in a bag by pounding.

In freezing, place the can in the tub with fine ice and coarse salt, using about 1 part of salt to 4 or 5 of ice. Get the mixture thoroughly chilled before starting to freeze. A small freezer ought to be done in 10 to 15 minutes. Do not freeze too firm. After freezing is accomplished, draw off the water, remove dasher, put a plug in the hole of cover and with a spoon pack solidly. Re-pack freezer with ice and salt, cover over with a damp cloth and leave until serving time. Ice cream is better if left at least 2 to 4 hours.

Should more than one batch be required, the first batch may be packed in a separate can and the next freezing proceeded with. The following recipes are some of the most popular varieties, the amounts given being for a 4 quart freezer:—

Vanilla Ice Cream, No. 1.

5 pints cream.

1½ cups sugar.

3 tablespoonfuls vanilla, to be varied according to strength.

Mix ingredients and freeze.

Vanilla Ice Cream, No. 2.

1 qt. scalded milk.

1 tablespoon flour.

1½ cups sugar.

1 egg.

1-8 teaspoon salt.

1 qt. cream.

2 tablespoons vanilla.

Mix flour and salt, add egg slightly beaten, and milk gradually.

Cook over hot water twenty minutes, stirring constantly at first. Should custard have curdled appearance, it will disappear in freezing. When cool add cream and flavoring. Strain and freeze.

Chocolate Ice Cream No. 1.

5 pints cream.

2 cups sugar.

1-8 teaspoon salt.

3 squares Baker's Chocolate, or $\frac{1}{2}$ cup prepared Cocoa.

2 tablespoons vanilla.

Mix chocolate and dilute with hot water to pour easily, add to cream, then add sugar, salt and flavoring and freeze.

Chocolate Ice Cream No. 2.

Use recipe Vanilla Ice Cream No. 2, melt 3 squares Baker's chocolate by placing in a small saucepan set in larger sauce pan of boiling water, and pour custard slowly on chocolate.

Strawberry Ice Cream.

5 pints cream.

2 boxes berries.

2 cups sugar.

Few grains salt.

Wash and hull berries, sprinkle with sugar, cover and let stand two hours, mash and squeeze through cheese cloth, then add salt. Freeze cream to the consistency of a mush, add gradually fruit juice and finish freezing.

Preserved fruit may be used in place of raw fruit.

Pineapple Ice Cream.

5 pints cream.

1 cup sugar.

2 cans grated pine apple.

Add pineapple to cream, let stand thirty minutes strain, add sugar and freeze.

Banana Ice Cream.

5 pints cream.

8 bananas.

2 $\frac{1}{2}$ tablespoons lemon juice.

2 cups sugar.

1-8 teaspoon salt.

Remove skins and scrape banana, then force through a sieve; add remaining ingredients and freeze.

Notes:

When ice-cream is required to be kept any length of time, thickener can be added, such as gelatine 1-3 oz. to the freezer. First dissolve the gelatine in hot water and strain, or 1 tablespoon corn starch dissolved in water and boiled. This will also give the ice cream a smoother grain.

In starting to freeze turn the freezer slowly at first until the cream nearly reaches the freezing point, then increase the speed as it is freezing. This will save the possibility of cream partially churning, will increase the swell and assist in giving a smoother grain.

Rough and coarse grain is usually caused by the cream being too sweet and too thin.

Very rich cream makes a heavy, soggy ice cream and will not swell as much in freezing.

Any variety of fruit ice cream can be made the same as strawberry ice cream, substituting the desired fruit for the strawberries and making in the same way.

Milk and Cream Testing.

The testing of milk and cream is becoming of more importance on the farm every year. It is the only way we can find out the profitable and unprofitable cows in the herd, get the cream of the proper percentage of fat for whatever purpose it is to be used, determine the losses in skimming and churning, and check the returns from the creamery or cheese factory.

The test is inexpensive to make and any one, by giving it a fair amount of study and practice can make an accurate test with a Babcock tester.

The details necessary to consider in making a test are given briefly as follows:

1. Get a representative sample of the milk to be tested and at a temperature of about 60 degrees F.
2. Mix the milk thoroughly by pouring from one vessel to another and allowing it to run down the side of the vessel to prevent foaming. If the sample is not thoroughly mixed, a representative sample cannot be obtained.
3. With a pipette take 17.6 c.c. of milk and deliver into a milk test bottle. To do this suck the milk into the pipette and quickly place the forefinger over the top to prevent the milk running out. Allow the milk to drop out until the surface of the milk is level with the 17.6 c. c. mark. Now place the tip of the pipette into the top of the bottle and allow the milk to run slowly out by removing the forefinger and holding the bottle in a slanting position.
4. Add to the milk 17.5 c.c. of commercial sulphuric acid at a temperature of 60 to 70 degrees. Hold the bottle slanting and allow the acid to run down the side and under the milk.
5. Mix the milk and acid thoroughly by giving a gentle rotary motion. Do not close the neck of the bottle while mixing.
6. Place the bottles in the machine in such a position that they are properly balanced and whirl at full speed of machine for 5 minutes (a 2 or 4 bottle machine 100 times per minute).
7. Add hot water at a temperature of 140 to 160 degrees to float the fat into the neck of the bottle up to the 6 or 8 mark.

8. Whirl machine again for two minutes.
9. Remove bottles from the tester and set in hot water to reach the top of the fat at a temperature of about 140 degrees F., for 2 or 3 minutes before reading.

Notes.

Read the fat in milk samples from the extreme ends of the fat, each small space is .2 or 2-10 of 1 per cent.

On double bore skim milk bottles, each space indicates .01 of 1 per cent.

On cream bottles each space is 1 per cent.

In reading cream samples an allowance must be made for the meniscus of from 1 to 2 per cent of the extreme length of the fat.

In testing cream, use cream test bottles and 18 c.c. sample, then proceed the same as in milk.

In testing skim milk and buttermilk, use the skim milk double bore bottle and proceed with testing the same as in whole milk.

Burnt or clouded readings may be caused by:—

Temperature of milk or acid being too high.

Too strong or too much acid

Allowing acid to drop directly on the milk.

Allowing the milk and acid to stand too long before mixing.

Light or clouded readings are caused by:—

Temperature of milk or acid being too low.

Using too weak or not enough acid.

Careless mixing or insufficient shaking.

Carefulness and exactness are absolutely essential in every detail. If accurate results are to be obtained in milk testing, all glassware must be washed thoroughly after each operation and kept clean.

Small testers complete can be obtained from any of the Dairy Supply houses at about the following cost.

Two bottles complete for testing milk.....	\$5.25
Two bottles complete for testing cream.....	6.00
Four bottles complete for testing milk and cream....	6.25
Four bottles complete for testing milk and cream....	7.50

Large machines about in proportion.

Skim milk bottles..... .75

Commercial Sulphuric Acid 4 to 6 cents per pound.

A more complete treatise on milk testing may be found in Canadian Dairying, by Dean; Farm Dairying, by Miss Rose; or Testing Milk and Its Products, by Farrington and Wolfe.

